ARCHIVES OF
Biochemistry and Biophysics

Volume 124 • 1968

Executive Editors

R. W. Estabrook
C. H. W. Hirs
F. M. Huennekens
H. S. Mason
F. F. Nord
P. K. Stumpf
H. Theorell
S. Udenfriend
W. J. Whelan

Editors

B. N. Ames
G. Ashwell
A. Bendich
J. Botts
R. D. Cole
K. Folkers
D. E. Green
F. Gros
E. Gross
L. P. Hager
H. O. Halvorson
O. Hayaishi
L. A. Heppel
R. L. Hill
L. E. Hokin
B. L. Horecker
F. E. Hunter
H. A. Itano
A. T. Jagendorf
H. M. Kalckar
E. Katchalski
S. Kaufman
W. Kauzmann
T. E. King
I. M. Klotz
W. Konigsberg
L. F. Leloir
C. H. Li
J. M. Lowenstein
F. Lynen
W. D. McElroy
H. R. Mahler
B. G. Malmström
C. L. Markert
A. Neuberger
L. Packer
L. H. Piette
R. R. Porter
J. C. Rabinowitz
L. J. Reed
H. Rudney
D. R. Sanadi
W. A. Schroeder
R. S. Schweet
M. Sela
D. Shemin
P. Siekevitz
M. V. Simpson
E. R. Stadtman
T. C. Stadtman
A. G. Szent-Györgyi
T. T. Tchen
K. V. Thimann
S. N. Timasheff
C. R. Treadwell
W. W. Umbreit
B. Vennesland
H. Weissbach
G. Weber
D. M. Ziegler

ACADEMIC PRESS
New York and London

Copyright © 1968, by Academic Press Inc.

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form by photostat, microfilm, or any other means, without written permission from the publishers.

Made in the United States of America

CONTENTS

FRANCIS QUETIER AND ETIENNE GUILLE. Studies on Plant Deoxyribonucleic Acids. I. Extraction, Fractionation, and Analytical Thermal Denaturation 1

HIROHISA MUROYA, RYOKUERO SUZUE, AND YORINORI HIKASA. Stimulation of Hepatic Cholesterol Biosynthesis by Dietary Glucose, and Its Relation to Cholesterol Gallstone Formation in the Hamster 12

DORIANO CAVALLINI, CARLO DE MARCO, AND SILVESTRO DUPRÉ. Luminol Chemiluminescence Studies of the Oxidation of Cysteine and Other Thiols to Disulfides 18

F. R. MANGAN, G. E. NEAL, AND D. C. WILLIAMS. Subcellular Distribution of Testosterone in Rat Prostate and Its Possible Relationship to Nuclear Ribonucleic Acid Synthesis 27

GUIDO TETTAMANTI AND WARD PIGMAN. Purification and Characterization of Bovine and Ovine Submaxillary Mucins 41

JEANNE V. DAHLEN, A. L. KENNAN, AND JOHN W. PORTER. Effect of Alloxan and Portacaval Shunt on the Synthesis of Fatty Acids and Sterols by Rat Liver 51

JOYCE H. JOHNSON AND HENRY TEDESCHI. Photometric Observations of Rat Liver Microsomal Suspensions 58

JOHN R. WHITAKER AND JAVIER PEREZ-VILLASEÑOR. Chemical Modification of Papain. I. Reaction with the Chloromethyl Ketones of Phenylalanine and Lysine and with Phenylmethylsulfonyl Fluoride 70

GURJIT S. AHLUWALIA, YASHPAL R. SAXENA, AND HAROLD H. WILLIAMS. Quantitative Studies on Selenite Metabolism in *Escherichia coli* 79

JOYCE WEST, D. J. MORTON, V. ESMANN, AND R. L. STJERNHOLM. Carbohydrate Metabolism in Leukocytes. VIII. Metabolic Activities of the Macrophage 85

A. B. FALCONE AND HERBERT I. HADLER. Action of Gramicidin on Mitochondria. I. Ion-Dependent Mitochondrial Volume Changes Energized by Adenosine 5′-Triphosphate 91

HERBERT I. HADLER AND A. B. FALCONE. Action of Gramicidin on Mitochondria. II. Ion-Dependent Mitochondrial Volume Changes Energized by Substrate Oxidation 110

A. B. FALCONE AND HERBERT I. HADLER. Action of Gramicidin on Mitochondria. III. Activity of Gramicidin Derivatives 115

H. F. DE LUCA, M. WELLER, J. W. BLUNT, AND P. F. NEVILLE. Synthesis, Biological Activity, and Metabolism of 22, 23-^{3}H-Vitamin D_4 122

KARL ERIK ALMIN AND KARL-ERIK ERIKSSON. Influence of Carboxymethyl Cellulose Properties on the Determination of Cellulase Activity in Absolute Terms 129

BENGT BUCHT AND KARL-ERIK ERIKSSON. Extracellular Enzyme System Utilized by the Rot Fungus *Stereum sanguinolentum* for the Breakdown of Celullose. I. Studies on the Enzyme Production 135

KARL-ERIK ERIKSSON AND BERT PETTERSSON. Extracellular Enzyme System Utilized by the Rot Fungus *Stereum sanguinolentum* for the Breakdown of Cellulose. II. Purification of the Cellulase 142

HÅKAN BJÖRNDAL AND KARL-ERIK ERIKSSON. Extracellular Enzyme System Utilized by the Rot Fungus *Stereum sanguinolentum* for the Breakdown of Cellulose. III. Characterization of Two Purified Cellulase Fractions 149

G. Pettersson and David L. Eaker. Studies on Cellulolytic Enzymes. IV. Chemical and Physicochemical Characterization of a Cellulase from *Penicillium notatum*.... 154

Karl-Erik Eriksson and Göran Pettersson. Studies on Cellulolytic Enzymes. V. Some Structural Properties of the Cellulase from *Penicillium notatum*..... 160

J. Thomas Moore, Jr. and J. L. Gaylor. Investigation of the Component Reactions of Sterol Demethylation: Preparation and Properties of Yeast Demethylase Activity.. 167

T. Y. Wang and E. W. Johns. Study of the Chromatin Acidic Proteins of Rat Liver: Heterogeneity and Complex Formation with Histones..... 176

D. S. Coffey, Jun Shimazaki, and H. G. Williams-Ashman. Polymerization of Deoxyribonucleotides in Relation to Androgen-Induced Prostatic Growth..... 184

Allen J. St. Angelo, Lawrence Y. Yatsu, and Aaron M. Altschul. Isolation of Edestin from Aleurone Grains of *Cannabis sativa*..... 199

J. J. Scocca and G. B. Pinchot. Inhibition and Release of Respiration in Particles from *Alcaligenes faecalis*..... 206

B. B. L. Agrawal and I. J. Goldstein. Protein–Carbohydrate Interaction. VII. Physical and Chemical Studies on Concanavalin A, the Hemagglutinin of the Jack Bean..... 218

Richard H. Himes and Teresa Wilder. Formyltetrahydrofolate Synthetase. Effect of pH and Temperature on the Reaction..... 230

Frederic L. Hoch. Thyroid Hormone Action on Mitochondria. I. Effects of Inhibitors of Respiration..... 238

Frederic L. Hoch. Thyroid Hormone Action on Mitochondria. II. Effects of Dinitrophenol..... 248

B. Rabinovitch. Transference of Triplet State Excitation Energy from Tryosine to Tryptophan. I. Amino Acids in Simple and Mixed Solutions..... 258

Mabel R. Hokin. Studies on Chemical Mechanisms of the Action of Neurotransmitters and Hormones. I. Relationship between Hormone-Stimulated ^{32}P Incorporation into Phosphatidic Acid and into Phosphatidylinositol in Pigeon Pancreas Slices..... 271

Mabel R. Hokin. Studies on Chemical Mechanisms of the Action of Neurotransmitters and Hormones. II. Increased Incorporation of ^{32}P into Phosphatides as a Second, Adaptive Response to Pancreozymin or Acetylcholine in Pigeon Pancreas Slices..... 280

Ira Weinryb. Alkylation of Horseradish Peroxidase with Iodoacetate..... 285

Tokuya Harada, Akira Misaki, and Hiroshi Saito. Curdlan: A Bacterial Gel-Forming β-1,3-Glucan..... 292

R. V. LaMotta, R. B. McComb, C. R. Noll, Jr., H. J. Wetstone, and R. F. Reinfrank. Multiple Forms of Serum Cholinesterase..... 299

Mark E. Smulson and Marco Rabinovitz. L-*O*-Methylthreonine—Synthesis and Mode of Action as an Isoleucine Antagonist..... 306

Barbara A. Blaylock. Cobamide-Dependent Methanol-Cyanocob(I)alamin Methyltransferase of *Methanosarcina barkeri*..... 314

R. Brightwell and A. L. Tappel. Subcellular Distributions and Properties of Rat Liver Phosphodiesterases..... 325

R. Brightwell and A. L. Tappel. Lysosomal Acid Pyrophosphatase and Acid Phosphatase..... 333

J. Tze-Fei Wong and G. R. Williams. The Mechanism of Liver Alcohol Dehydrogenase 344

D. N. Misra and P. Ganguly. Negative Staining of Human Hemoglobin Molecules with Uranyl Acetate 349

R. K. Ellsworth and S. Aronoff. Investigations of the Biogenesis of Chlorophyll *a*. I. Purification and Mass Spectra of Maleimides from the Oxidation of Chlorophyll and Related Compounds 358

Don W. Stubbs and Dale B. Haufrect. Effects of Actinomycin D and Puromycin on Induction of Gulonolactone Hydrolase by Somatotrophic Hormone 365

John F. Van Pilsum and Frank Ungar. Effect of Castration and Steroid Sex Hormones on Rat Kidney Transamidinase 372

B. E. Wright, D. Dahlberg, and C. Ward. Cell Wall Synthesis in *Dictyostelium discoideum*. A Model System for the Synthesis of Alkali-Insoluble Cell Wall Glycogen during Differentiation 380

C. J. Chesterton, P. H. W. Butterworth, A. S. Abramovitz, E. J. Jacob, and John W. Porter. Incorporation of Pantothenate-1-^{14}C into Pigeon Liver Fatty Acid Synthetase: 4′-Phosphopantetheine, A Prosthetic Group of the Multienzyme Complex 386

E. John Jacob, P. H. W. Butterworth, and J. W. Porter. Studies on the Substrate Binding Sites of the Pigeon Liver Fatty Acid Synthetase 392

T. O. Diener and I. R. Schneider. Virus Degradation and Nucleic Acid Release in Single-Phase Phenol Systems 401

Joseph A. Orlando. Light-Dependent Reduction of Nicotinamide Adenine Dinucleotide Phosphate by Chromatophores of *Rhodopseudomonas spheroides* 413

Arun Kumar Rawat. Some Observations on the Aspergillin of *Aspergillus niger* 418

John A. Duerre. *In Vivo* and *in Vitro* Metabolism of *S*-Adenosyl-L-Homocysteine by *Saccharomyces cerevisiae* 422

Claire Dick. Isolation of Nuclei and Histones from Roots of *Vicia faba* 431

Mary L. C. Bernheim and Paul Hochstein. Reduction of Hydroxylamine by Rat Liver Mitochondria 436

D. Keglević, B. Ladešić, and M. Pokorny. Biochemical Studies in Tobacco Plants. IV. *N*-Malonylmethionine, Metabolite of D-Methionine in *Nicotiana rustica* 443

Ralph W. McKee, Mary Ellen Parks, and Arlene Dickey. Influence of Iodoacetate on Glycolytic Intermediates and on Respiration in Ehrlich-Lettre Ascites Carcinoma Cells 450

Hirochika Komai and J. B. Neilands. Effect of Zinc Ions on δ-aminolevulinate Dehydratase in *Ustilago sphaerogena* 456

D. Perlman and John I. Toohey. Cobalt-Free Corrinoids as Vitamin B_{12} Antagonists 462

L. Y. Yatsu and T. J. Jacks. Association of Lysosomal Activity with Aleurone Grains in Plant Seeds 466

Yasuo Iwanami and Gene M. Brown. Methylated Bases of Transfer Ribonucleic Acid from HeLa and L Cells 472

Lloyd A. Culp and Gene M. Brown. Transfer Ribonucleic Acid Methylases of HeLa Cells 483

Sue S. Sanders, James F. Kurfees, and W. S. Rehm. Estimation of the Electromotive Force of the H^+ Mechanism of the Frog Stomach by Voltage-Clamping..... 493

Göran Pettersson and Lennart Andersson. Influence of Hydrogen Ions on the Stability and Structure of a Cellulase from *Penicillium notatum*..... 497

J. F. Preston, III, and J. E. Gander. Isolation and Partial Characterization of the Extracellular Polysaccharides of *Penicillium charlesii*. I. Occurrence of Galactofuranose in High Molecular Weight Polymers..... 504

S. Hasegawa and C. W. Nagel. Isolation of an Oligogalacturonate Hydrolase from a *Bacillus* Specie..... 513

K. S. Morey, Katalin Tarczy-Hornoch, and W. Duane Brown. Myosin from Dystrophic and Control Chicken Muscle. II. Molecular Weight, Electrophoretic Properties, Salt Sensitivity, Aggregation, and Amino Acid Composition..... 521

G. Royer and W. J. Canady. A Common Size Parameter for Hydrophobic Binding of Inhibitors by α-Chymotrypsin, Alkylated α-Chymotrypsin, and Yeast Alcohol Dehydrogenase..... 530

K. N. Subramanian, G. Padmanaban, and P. S. Sarma. Control of Nitrate Reductase by Iron in *Neurospora crassa*..... 535

Eldad Giberman. Simultaneous Measurements of Potassium Influx and Efflux in *Bacillus megaterium*..... 543

Richard G. Allison and Robert E. Feeney. Penguin Blood Serum Proteins..... 548

J. L. Cohen, S. Srinivasan, and P. N. Sawyer. Determination of Sedimentation Potentials of Canine Erythrocytes..... 556

David T. Osuga and Robert E. Feeney. Biochemistry of the Egg-White Proteins of the Ratite Group..... 560

E. Storey. Calcium and Strontium Changes in Bone Associated with Continuous Administration of Stable Strontium to Rats..... 575

Donald R. Buhler and Mary E. Rasmusson. Reduction of *p*-Nitrobenzoic Acid by Fishes..... 582

Ryuichiro Suzuki, Kiyomi Sato, and Shigeru Tsuiki. Pyruvate Inhibition of Glycolysis in Ehrlich Ascites Tumor Cells..... 596

COMMUNICATIONS

Arthur Bienenstock and Aaron S. Posner. Calculation of the X-Ray Intensities from Arrays of Small Crystallites of Hydroxyapatite..... 604

Tomohiko Mori, Fumio Ibuki, Setsuro Matsushita, and Tadao Hata. Occurrence of Ribonucleic Acids That Have Template Activities in Soybean Seeds..... 607

Akira Kobata, Evelyn F. Grollman, and Victor Ginsburg. An Enzymic Basis for Blood Type A in Humans..... 609

Donald Jerina, Gordon Guroff, and John Daly. Enzymic and Nonenzymic Hydroxylation and Chlorination of *p*-Deuteroanisole..... 612

List of Forthcoming Papers..... 616

Author Index..... 617

Subject Index..... 619